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IS 11893 (1986): Potato Planter, Semi-automatic [FAD 21: Farm Implements and Machinery]



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IS : 11893 - 1986

Indian Standard

SPECIFICATION FOR
POTATO PLANTER, SEMI-AUTOMATIC

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR POTATO PLANTER, SEMI-AUTOMATIC

Sowing, Fertilizer and Manure Application Equipment
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Indian Standard

SPECIFICATION FOR POTATO PLANTER, SEMI-AUTOMATIC

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 27 October 1986, after the draft finalized by the Sowing, Fertilizer and Manure Application Equipment Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Potato is one of the important cash crops in our country. But the main bottleneck in increasing the area under potato cultivation has been its high labour requirements for planting, earthing, etc. In order to ensure timely planting of potatoes and to reduce the cost of planting, potato planters are widely used in our country. This standard is being issued to guide the manufacturers to produce quality product and the users to help in the selection of planters that would give the required performance.

0.3 In the preparation of this standard, assistance has been derived from Punjab Agricultural University, Ludhiana.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in a rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies material, constructional, performance and other requirements of semi-automatic potato planter.

2. TERMINOLOGY

2.1 For the purpose of this standard the definitions given in 2 of IS : 9856-1981† shall apply.

*Rules for rounding off numerical values (*revised*).

†Test code for potato planters.

3. MATERIALS

3.1 The materials for the construction of different components of the potato planter shall be selected from those given in col 3 of Table 1. The material shall, as far as possible, conform to standards and grades as given in col 4 and 5 of Table 1.

4. HARDNESS

4.1 The share shall have a hardness of 350 to 450 *HB* when tested in accordance with IS : 1500-1983*.

5. CONSTRUCTIONAL REQUIREMENTS

5.1 Frame — It shall be rigid and strong.

5.2 Wheels — Wheels shall have either bushes or dustproof bearing with provision for lubrication.

5.3 Axles and Shafts — Axles and shafts shall be so attached that they can be easily removed for cleaning when required.

5.4 Seed Box — The seed box shall have adequate capacity and may have sloping bottom. The box shall be sufficiently strong and shall not buckle when fully filled with potato tubers.

5.4.1 The thickness of mild steel and galvanized steel sheet for box shall be not less than 1.0 mm and 0.63 mm respectively.

5.5 Furrow Openers — Furrow openers shall be of ridger type with adjustable wings.

5.6 Seed Metering Mechanism — Metering mechanism shall be of horizontally revolving ring type or of belt with cups.

5.7 Seed Carrying Chute — The chute shall be of suitable length and shall be properly clamped with feed outlets of metering mechanism.

5.8 Transmission System — This may be sproket and chain, belt and pulley, or gear type with proper guards. Provisions for tightening of belt and adjustment of chain shall be provided.

6. PERFORMANCE REQUIREMENTS

6.1 The variation in dropping of seed from each chute shall be not more than 5 percent from the average quantity obtained.

6.2 The variation in quantity of seed dropped per hectare and quantity specified to be dropped at a particular setting shall be not more than 7 percent.

*Method for Brinell hardness test for metallic material (*second revision*).

TABLE 1 MATERIALS FOR CONSTRUCTION OF VARIOUS COMPONENTS

(Clause 3.1)

SL No.	COMPONENT	MATERIAL	APPLICABLE STANDARD	GRADE
(1)	(2)	(3)	(4)	(5)
i)	Frame	Mild steel	IS : 226-1975*	—
ii)	Wheel	Mild steel	IS : 226-1975*	—
		Cast iron	IS : 210-1978†	FG 200
		Pneumatic tyre	—	—
iii)	Axle and shaft	Mild steel	IS : 226-1975*	—
iv)	Seed box	Mild steel	IS : 226-1975*	—
		Galvanized steel sheet	IS : 277 1977‡	—
		Plastics	—	—
		Fibreglass	—	—
v)	Tines	Mild steel	IS : 226-1975*	—
		Carbon steel	IS : 1570 (Part 2)- 1979§	C 55 Mn 75
vi)	Furrow opener	High carbon steel	IS : 1570 (Part 2)- 1979§	C 75
vii)	Seed carrying chute	Mild steel	IS : 226-1975*	—
		Plastics	—	—
viii)	Seed metering mechanism	Cast iron	IS : 210-1978†	FG-200
		Mild steel	IS : 226-1975*	—
		Aluminium	IS : 617-1975	A-4M
		Brass	IS : 292-1983¶	3
		Gun metal	IS : 306-1983**	—
		Plastics	—	—
ix)	Bushes	Brass	IS : 292 1983¶	—
		Gun metal	IS : 306-1983**	—
		Nylon	—	—
x)	Pulley, sprocket and gear	Cast iron	IS : 210-1978†	FG-200
		Mild steel	IS : 226-1975*	—
xi)	Hitching mechanism	Mild steel	IS : 226-1975*	—
xii)	Feed, adjusting mechanism	Mild steel	IS : 226-1975*	—
		Cast iron	IS : 210-1978†	FG-200
xiii)	Depth adjusting mechanism	Mild steel	IS : 226-1975*	—
		Cast iron	IS : 210-1978†	—
xiv)	Marker	Mild steel	IS : 226-1975*	FG-200
xv)	Seat	Mild steel	IS : 226-1975*	—
xvi)	Foot rest	Mild steel	IS : 226-1975*	—

*Specification for structural steel (standard quality) (fifth revision).

†Specification for grey iron castings (third revision).

‡Specification for steel sheets, galvanized (plain and corrugated) (third revision).

§Schedules for wrought steels for general engineering purposes: Part 2 Carbon steels (unalloyed steels) (first revision).

||Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (second revision).

¶Specification for leaded brass ingots and castings (second revision).

**Specification for tin bronze ingots and castings (third revision).

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- 6.3 The percentage of germ damage shall not exceed 0.5 percent.
- 6.4 The variation in dropping due to box filling at 1/4, 1/2, and 3/4 of rated capacity shall not exceed by 10 percent.
- 6.5 The variation in number of seed tubers per metre of row length shall not exceed by 10 percent.
- 6.6 The planter shall be able to plant tuber with 200 mm soil cover.
- 6.7 The wheel slip at specified speed shall not exceed by 10 percent.
- 6.8 The percentage variation of elevating error in case of cup elevator planters shall not exceed by 10 percent.
- 6.9 The above requirements shall be tested in accordance with IS : 9856-1981* as detailed below:

Performance Requirements
(Ref to Cl No. in This
Standard)

<i>Method of Test</i> (Ref to Cl No. of IS : 9856-1981*)	
Type Testing	Routine Testing
(2)	(3)
6.2.1 and 7.3.1	6.2.1
6.3	6.3
6.2.2	—
7.3.1	7.3.1
7.3.1	—
7.3.2.1 and 7.3.2.2	—
6.4	—

7. OTHER REQUIREMENTS

- 7.1 The row spacing shall be adjustable-ranging from 450 to 600 mm preferably in steps of 50 mm.
- 7.2 When the furrow openers are lowered to levelled surface, the openers shall not deviate by the more than 5 mm from the line of alignment vertically and horizontally.
- 7.3 Proper lubrication arrangements shall be provided for all moving components except the portions exposed to seed tuber.
- 7.4 The Hitching arrangement shall be designed to suit the three point linkage specified in IS : 4468-1986†.

*Test code for potato planters.

†Specification for dimensions for three-point linkage of agricultural wheeled tractors (second revision).

7.5 Each planter shall be provided with instruction manual containing full information on method of installation and operation of the planter. It shall also be provided with a manual containing maintenance and safety instructions, calibration chart, etc.

7.5.1 Each planter shall also be supplied with necessary standard tools.

7.6 Each planter shall be provided with the following accessories:

- a) Foot rest;
- b) Row, marker; and
- c) Area recorder.

8. WORKMANSHIP AND FINISH

8.1 The welding shall be satisfactory in all respects and shall not be brittle or porous.

8.2 The components shall be free from rust and shall have a protective coating to prevent surface deterioration in transit and storage.

8.3 The components shall be free from pits, burrs and other defects that may be detrimental for their use.

9. MARKING AND PACKING

9.1 Marking — Each planter shall be marked with the following particulars:

- a) Manufacturer's name and trade-mark, if any; and
- b) Model, code and serial number.

9.1.1 Each planter may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

9.2 Packing — Packing of the planter and its components shall be done as agreed to between the purchaser and the supplier to avoid damage in transit.

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10. TESTS

10.1 One planter of each model shall be tested for all the requirements mentioned in this standard.

10.2 Each planter of a model shall be tested for requirements mentioned in 6.1 to 6.3, 6.5, 7.1 to 7.4 and 9.1 to 9.3.

10.3 The testing of the potato planter shall be done in accordance with IS : 9856-1981*.

11. SAMPLING

11.1 Unless otherwise agreed to between the purchaser and the supplier, the sampling of the planter for lot acceptance shall be done in accordance with IS : 7201-1974†.

*Test code for potato planters.

†Methods of sampling of agricultural machinery and tractors.